

WHAT IS CLAIMED IS:

1 1. A method of reducing power required for transmitting a signal from a
2 first transceiver to a second transceiver, comprising the acts of:

3 estimating an excess amount of power used by said first transceiver for
4 transmitting said signal;

5 reducing a power use of said first transceiver by said excess amount of power
6 to a reduced power level; and

7 transmitting said signal from said first transceiver using said reduced power
8 level, wherein said reduced power level achieves a transmission rate of said signal within a
9 predefined tolerance of a target rate thereof.

1 2. The method of claim 1, wherein said first transceiver is located at one
2 of a central office and a remote loop carrier, and comprises a downstream transmitter and an
3 upstream receiver, and wherein said second transceiver is located at an end user location and
4 comprises an upstream transmitter and a downstream receiver.

1 3. The method of claim 2, wherein said excess amount of power for said
2 signal is estimated in accordance with a measured value of upstream attenuation.

1 4. The method of claim 3, wherein said measured value of upstream
2 attenuation is calculated as a difference between a total transmit power transmitted from said
3 upstream transmitter and a measured power of an upstream signal received at said upstream
4 receiver.

1 5. The method of claim 4, wherein a value of said excess amount of
2 power of said signal is associated with a value of said upstream attenuation in a table.

1 6. The method of claim 2, wherein said first transceiver estimates a per
2 carrier signal-to-noise ration (SNR) in accordance with bit-per-carrier, power-per-carrier, and
3 SNR margin information received from said second transceiver.

1 7. The method of claim 6, wherein said first transceiver uses said bit per
2 carrier information for estimating a rate of said signal and a rate of said signal transmitted at a
3 selected reduced power level, for ensuring said transmission rate is maintained within said
4 predefined tolerance.

1 8. The method of claim 7, wherein a second initialization is required for
2 transmitting said signal at said reduced power level.

1 9. The method of claim 2, wherein said first transceiver reduces said
2 power in accordance with an excess SNR provided by said second transceiver.

1 10. The method of claim 9, wherein a second initialization is required for
2 transmitting said signal at said reduced power level.

1 11. The method of claim 2, wherein said excess amount of power is
2 estimated by estimating an excess amount of SNR at said second transceiver for said target
3 rate.

1 12. The method of claim 2, wherein said first transceiver provides said
2 second transceiver with a minimum SNR inflated by a value N corresponding to said excess
3 amount of power, and wherein said first transceiver transmits at a power level reduced by
4 said value N if said second transceiver is capable of supporting said minimum SNR inflated
5 by said value N.

1 13. A method of reducing power required for transmitting a signal from a
2 first transceiver to a second transceiver, comprising the steps of:
3 determining at said second transceiver an amount of excess power in said
4 signal transmitted from said first transceiver;
5 calculating at said second transceiver an attainable reduced power level for
6 said transmitted signal; and
7 communicating said reduced power level between said second and first
8 transceivers, wherein said first transceiver adjusts its power level prior to a time period that
9 would require a second initialization.

1 14. The method of claim 13, wherein said second transceiver indicates a
2 power cutback implicitly by reducing power-per-carrier information communicated to said
3 first transceiver.

1 15. An apparatus for reducing power required for transmitting a signal
2 from a central office asymmetric digital subscriber line (ADSL) termination unit (ATU-C) to

a remote ADSL termination unit (ATU-R), wherein said ATU-C includes a processor for controlling said ATU-C to implement processing including the acts of:

- estimating an excess amount of power used by said ATU-C for transmitting said signal;
- reducing a power use of said ATU-C by said excess amount of power to a reduced power level; and
- transmitting said signal from said ATU-C using said reduced power level,

wherein said reduced power level achieves a transmission rate of said signal within a predefined tolerance of a target rate thereof.

16. The apparatus of claim 15, wherein said excess amount of power for said signal is estimated in accordance with a measured value of upstream attenuation.

17. The apparatus of claim 16, wherein said measured value of upstream attenuation is calculated as a difference between a total transmit power transmitted from said ATU-C and a measured power of an upstream signal received at said ATU-C.

18. The apparatus of claim 17, wherein a value of said excess amount of power of said signal is associated with a value of said upstream attenuation in a table.

19. The apparatus of claim 15, wherein said ATU-C estimates a per carrier signal-to-noise ration (SNR) in accordance with bit-per-carrier, power-per-carrier, and SNR margin information received from said ATU-R.

20. The apparatus of claim 19, wherein said ATU-C uses said bit per carrier information for estimating a rate of said signal and a rate of said signal transmitted at a selected reduced power level, for ensuring said transmission rate is maintained within said predefined tolerance.

21. The apparatus of claim 20, wherein a second initialization is required for transmitting said signal at said reduced power level.

22. The apparatus of claim 15, wherein said ATU-C reduces said power in accordance with an excess SNR provided by said ATU-R.

23. The apparatus of claim 22, wherein a second initialization is required for transmitting said signal at said reduced power level.

1 24. The apparatus of claim 15, wherein said excess amount of power is
2 estimated by estimating an excess amount of SNR at said ATU-R for said target rate.

1 25. The apparatus of claim 15, wherein said ATU-C provides said ATU-R
2 with a minimum SNR inflated by a value N corresponding to said excess amount of power,
3 and wherein said ATU-C transmits at a power level reduced by said value N if said ATU-R is
4 capable of supporting said minimum SNR inflated by said value N.

1 26. An apparatus for reducing power required for transmitting a signal
2 from a central office asymmetric digital subscriber line (ADSL) termination unit (ATU-C) to
3 a remote ADSL termination unit (ATU-R), wherein said ATU-R includes a processor for
4 controlling said ATU-R to implement processing including the acts of:

5 determining an amount of excess power in said signal transmitted from said
6 ATU-C;
7 calculating an attainable reduced power level for said transmitted signal; and
8 communicating said reduced power level to said ATU-C, wherein said ATU-C
9 adjusts its power level prior to a time period that would require a second initialization.

1 27. The apparatus of claim 26, wherein said ATU-R indicates a power
2 cutback implicitly by reducing power-per-carrier information communicated to said ATU-C.